IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: **John E. Maloney and Robert J. Anderson**	Confirmation No.: **7782**
Application No.: **10/748,367**	Group Art Unit: **2617**
Filing Date: **December 30, 2003**	Examiner: **Julie E. Stein**

For: **TDOA/GPS Hybrid Wireless Location System**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

DECLARATION PURSUANT TO 37 CFR § 1.131

We, Robert J. Anderson and John E. Maloney, declare and say that:

1. We are the named inventors of the invention described and claimed in U.S. Patent Application No. 10/748,367, filed December 30, 2003.

2. We are each familiar with the subject application and the associated rejections set forth in the Office Actions dated October 17, 2005, and June 6, 2006. Each of us is also familiar with the references cited by the U.S. Patent and Trademark Office in connection with the outstanding Final Rejection, including the principal reference, entitled "The Qualcomm/SnapTrack Wireless-Assisted GPS Hybrid Positioning System and Results From Initial Commercial Deployments," Z. Biacs, G. Marshall, M. Moeglein, W. Riley (Biacs et al.). The Biacs et al reference appears to have been presented on Monday, December 8, 2003, at the CDMA Americas Congress 2003 Workshop II.

3. In particular, we understand that our pending claims 1-3, 7, 9-12, 16, and 18-20 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Biacs et al. in view of

U.S. Patent Application Publication No. 2004/0203853 (Sheynblat). We further understand that the examiner has alleged that Biacs et al. teach all the steps/elements of independent claims 1 and 11. The Office Actions indicate that the examiner feels that Biacs et al. disclose a method and system for the determination of the location of a mobile station equipped with embedded GPS signal reception capability and equipped to operate within a wireless communications network, etc. (See pp. 2 – 5 of the Office Action dated June 6, 2006.) The examiner has further alleged that "Biacs does not explicitly teach receiving the GPS data at a land station, receiving a communications-band signal at a land station equipped with location-measurement facilities, or performing location-determination calculation at a land station equipped for location-determination calculations." (Office Action, p. 3.) The Examiner has further stated: "But, Biacs does teach that the GPS and communications-band signal are received by a PDE. In addition Sheynblat teaches in the same field of invention, a hybrid location system, that a location server, such as a PDE can be a base station thus a ground station. See paragraph 31." (Office Action p. 3.)

4. Accordingly, it appears that the examiner is citing Biacs et al. as the primary reference in rejecting our claims 1-20. In view of this, we are submitting this declaration in order to antedate Biacs et al. as a prior art reference vis-à-vis the invention set forth in claims 1-20 of the present application.

5. In accordance with 37 CFR § 1.131, as inventors of the subject matter of the rejected claims, and without conceding the propriety of the outstanding rejections, we hereby declare that we invented the subject matter of the rejected claims prior to the December 8, 2003 purported presentation date of Biacs et al. We further hereby declare that we worked diligently from a date prior to December 8, 2003, to our patent application filing date of December 30, 2003, in order to prepare said application. The preparation of our patent application was done in cooperation with our patent attorney, Michael D. Stein, Esq.

6. In support of the instant Declaration, we are attaching a redacted copy of a document entitled "TruePosition Proposal for Wireless Location Services Based On Lb Interface, prepared for [customer name redacted]". This is referred to as "Proposal Document" below. In further support of the instant declaration, we are attaching a copy of a document entitled "IP:

Integration of Infrastructure And AGPS," which is a draft outline of our patent application prepared by co-inventor John E. Maloney. Each of these documents was completed prior to December 8, 2003.

Summary of Our Invention

7. The title of our patent application provides an apt, high level description of our claimed invention: "TDOA/GPS Hybrid Wireless Location Solution". More particularly, our invention relates to a "hybrid" wireless location solution that employs both infrastructure-based and handset-based approaches for locating wireless devices. An example of an infrastructure-based approach is network-based uplink time difference of arrival (U-TDOA), an approach in which uplink communications-band signals from a mobile station are received at multiple land-based receivers and these signals are used to calculate the location of the mobile unit. Examples of a handset-based approach include GPS and Assisted-GPS, in which the mobile station receives signals from multiple GPS satellites and makes timing measurements, which in turn are used to calculate the mobile unit's location.

8. Moreover, as described in our specification in paras. 2 – 10 and 12, there are situations in which neither infrastructure-based nor handset-based approaches will provide an acceptable location solution. In these situations, our invention provides a method and system that can solve this problem. "To exploit the distinct optimal advantages in location determination of both the GPS-based performance and the infrastructure-based performance, the present invention provides the technology for the integration of information from both types of processing to locate wireless mobile communications units." (Specification, para. 13.) See also para. 20:

> The present invention provides technology for the determination of the location and motion of a wireless communications mobile station (MS) device, such as a cellular telephone or personal digital assistant, or the like. The location parameters are determined through the integrated evaluation of location-related radio-frequency (RF) signal characteristic measurements for a combination of Global Positioning System (GPS) signals together with communications infrastructure signals . . . Through GPS receiver facilities embedded within the communications device to be located, GPS satellite space vehicle (SV) signals are received to support the determination of the MS location. The characteristic GPS measurements of primary interest are times of arrival of the SV signals in the GPS

> transmission band(s) at the position of the receiving MS. Additionally, the inherent communications facilities in the MS device as well as in the communications system infrastructure equipment deployed at land station (LS) sites provide communications-band signals that are also processed for the calculation of location-related parameters. These infrastructure-based signal characteristics include times or time differences of signal arrival (TOAs or TDOAs), . . . for the MS of interest. The present invention describes techniques that enable and apply the integration of measurement information regarding both types of signals, i.e., in both GPS and communications frequency bands, for determination of an optimal estimate of the MS location. . . .

(Specification, para. 12.)

9. Our invention as defined by independent claims 1 and 11comprises a "hybrid" method and system for determining the location of a mobile station "equipped with embedded GPS signal reception capability and equipped to operate within a wireless communications network." The claimed method and system include the steps of, or means for: receiving GPS data at a land station; at a land station equipped with location-measurement facilities, receiving a communications-band signal from said MS to be located and using the location-measurement facilities to extract location-related characteristic data from the communications-band signal; and at a land station equipped for location-determination calculations, performing location-determination calculations using the GPS data and the extracted location-related characteristic data to derive an estimated location for the MS. Other aspects of the claimed method and system are recited in the dependent claims.

Our Date of Invention

10. The Proposal Document includes information relating to our "TDOA/GPS Hybrid Wireless Location Solution" invention, and this document provides clear evidence that we, as employees of the assignee, TruePosition, Inc., conceived of our invention as recited in independent claims 1 and 11, prior to December 8, 2003. For example, on p. 1, the document states, "TruePosition will show in this proposal that hybrid location techniques have significant merit, both technically and commercially. TruePosition believes that the hybrid approach offers

the best overall performance option for a location network in terms of both overall accuracy and yield."

11. The Proposal Document includes additional information relating to our claimed invention. On pp. 6 – 7, the document states: "The TruePosition iFind™ A-GPS solution has the following characteristics: . . . Computes hybrid locations by combining AGPS and TDOA hyperbolic time-baselines." On p. 8, the document further explains our "hybrid" solution:

> **Hybrid:** An estimated accuracy improvement of 30% over U-TDOA alone in "partially blocked" A-GPS environments is expected from the hybridization of location methods. Hybridization combines information from location methods including A-GPS and U-TDOA.
>
> Enhanced Cell ID is the simplest to integrate in this model. For the case in which neither A-GPS nor U-TDOA is deployed in a market, the iFind™ ECID solution can provide a minimal level of service. Further, the current TruePosition iFind™ SMLC already contains the topological information needed to determine if advanced U-TDOA service (or future A-GPS service) is offered in a specific coverage area.
>
> Hybridization becomes significantly more attractive when combining A-GPS and U-TDOA data to produce a "blended" location. As background, both the A-GPS and U-TDOA system rely on the use of Time Difference of Arrival and generate hyperbolic time baselines. For each satellite or terrestrial antenna used in the solution, a baseline is constructed. These baselines are placed jointly into the TruePosition geospatial algorithm to calculate an optimal solution.

(Proposal Document, p. 8.) See also p. 9:

> Figure 3 illustrates the effect when an A-GPS calculation is partially blocked, resulting in poor resolution in the "Y" direction. The U-TDOA measurements are able to augment the failed A-GPS "Y" component and produce a location that is better than either the U-TDOA or A-GPS alone.
>
> If too few baselines are available due to satellite or terrestrial blockage or interference, the hybrid model makes a location possible where either single method would fail.

(Proposal Document, p. 9.)

12. The second document attached hereto, entitled "IP: Integration of Infrastructure And AGPS," was a preliminary outline of our patent application prepared by co-inventor John E.

Maloney at the request of Robert J. Anderson. This document was prepared prior to December 2003, and it provides further corroboration of our conception of the invention recited by independent claims 1 and 11, prior to the reference date of December 8, 2003. For example, the "Summary Description" states:

> MS Loc via optimal combination/integration of infrastructure And GPS
> . accuracy dependens [*sic, depends*] upon "combination/integration" procedures"

What this means is that the location of the mobile station ("MS Loc") is determined via a hybrid solution including infrastructure-based technology and GPS technology.

13. In the table below, we summarize and particularly point out descriptive text showing that our invention as recited by independent claim 1 was conceived prior to December 8, 2003, as evidenced by the attached Proposal Document and "IP: Integration of Infrastructure And AGPS".

Claim 1	**Support in Proposal Document and IP: Integration of Infrastructure And AGPS**
1. (Original) A method for the determination of the location of a mobile station (MS) equipped with embedded GPS signal reception capability and equipped to operate within a wireless communications network, the method comprising:	See generally Proposal Document, para 2.1, p. 2; para 3.5, pp. 6-7; para 4.1, pp. 8, 9, 10; para 5, pp. 13-14. See generally "IP: Integration of Infrastructure And AGPS": all content under totality of "Summary Description" and "Detailed Description".
(a) receiving GPS data at a land station, said GPS data being received from a MS to be located;	A mobile station (MS) provides GPS data to a land station. See Proposal Document, pp. 6 – 7: "The TruePosition iFind™ A-GPS solution has the following characteristics: . . . Supports in-call RRLP (SMLC-MS location protocol) to provide assistance data to the MS ***and receive measurements (or pseudo ranges) from the MS***" [emphasis supplied].
(b) at a land station equipped with location-measurement facilities, receiving a communications-band signal from said MS to be located and using the location-measurement facilities to extract location-related characteristic data from the communications-band signal; and	This step corresponds, e.g., to a receiver station or LMU receiving uplink signals from the MS and extracting time of arrival information. This is referenced in the Proposal Document via references to U-TDOA using LMU's (Location Measuring Units). See Proposal Document at p. 2 and Figure 2-1. See also IP: Integration of Infrastructure And AGPS:

	. . measurement types . . . (A)GPS: location parameters (lat, lon, vel/rates, time); pseudo-range & rate meas.s . . . infrastructure: location parameters; signal-based measurements . . . . T(D)OAs; FDOAs; AOAs; TAs; relative forward/reverse powers . . . . Tx & Rx powers, if Tx is available
(c) at a land station equipped for location-determination calculations, performing location-determination calculations using the GPS data and the extracted location-related characteristic data to derive an estimated location for the MS.	See Proposal Document at p. 2: "Meanwhile, the Location Calculator performs calculations for all technologies including Enhanced Cell ID, A-GPS and U-TDOA." See also p. 7: "Computes hybrid locations by combining AGPS and TDOA hyperbolic time-baselines"

14. The above table also supports our conception of independent claim 11.

15. The following table shows that the subject matter of our dependent claims was conceived by us before December 8, 2003.

Dependent Claims	**Support in Proposal Document and IP: Integration of Infrastructure And AGPS**
2. (Previously presented) A method as recited in claim 1, further comprising providing assistance data to the MS to be located, said assistance data enhancing the ability of the MS to receive GPS signals and extract TOA or pseudorange measures, wherein said TOA or pseudorange measures are then communicated to the said land station equipped with location-measurement facilities.	Claims 2 & 20: Proposal Document: para 3.5, p. 7 -- The communications protocol standards, i.e., RRLP, specifies the content formats for the provision of the assistance to the MS and the receipt of the pseudorange data for transfer to the SMLC (i.e., the location-determination station in GSM standards). IP: Integration of Infrastructure And AGPS: Under "Detailed Description," the inclusion of "AGPS" inherently and implicitly includes provision of the AGPS "assistance" and collection of the GPS-based TOA or pseudorange measures in compliance with the (e.g., GSM) communications network standards (specified for AGPS operation).
3. (Original) A method as recited in claim 1, further comprising communicating the GPS data and the extracted location-related characteristic data to said land station equipped for location-determination calculations.	Claims 3 & 12: Proposal Document: para 3.5, pp. 6,7; para 4.1, p. 10. IP: Integration of Infrastructure And AGPS: Under "Detailed Description," the "Data exchange mechanisms" support the communication of the exploited

	data to the "SMLC," wherein the location-determination calculations are accomplished.
4. (Original) A method as recited in claim 1, wherein said location-related characteristic data extracted from the communications-band signal includes time of arrival (TOA) data.	Claims 4 & 13: IP: Integration of Infrastructure And AGPS: Under "Detailed Description," "infrastructure" "measurement types," the "T(D)OAs" type includes "TOAs".
5. (Original) A method as recited in claim 1, wherein said location-related characteristic data extracted from the communications-band signal includes time difference of arrival (TDOA) data.	Claims 5 & 14: Proposal Document: all occurrences of the term "hybrid" and /or "hybridization", e.g., including all of the support for claims 1 & 11. IP: Integration of Infrastructure And AGPS: Under "Detailed Description" "infrastructure" "measurement types," the "T(D)OAs" type includes "TDOAs"
6. (Original) A method as recited in claim 1, wherein said location-related characteristic data extracted from the communications-band signal includes angle of arrival (AOA) data.	Claims 6 & 15: IP: Integration of Infrastructure And AGPS: Under "Detailed Description" "infrastructure" "measurement types," the AOAs type is included.
7. (Original) A method as recited in claim 1, wherein said location-related characteristic data extracted from the communications-band signal includes data concerning signal strength or propagation loss (PL).	Claims 7 & 16: Proposal Document: para 3.4, p. 6; para 4.1, p. 10 -- The proposed approach includes Enhanced Cell ID, which is described in accord with communications network standard[s] as exploiting "Timing Advance and Measurement Reports." The reported measures include information describing signal power. The proposed "hybrid" processing integrates all available information, including that of Enhanced Cell ID. IP: Integration of Infrastructure And AGPS: Under "Detailed Description" "infrastructure" "measurement types," various "powers" types are included.
8. (Original) A method as recited in claim 1, wherein said location-related characteristic data extracted from the communications-band signal includes timing advance (TA) data.	Claims 8 & 17: Proposal Document: para 3.4, p. 6; para 4.1, p. 8-- The proposed approach includes "Enhanced Cell ID," which is described in accord with communications network "standard[s]" as exploiting "Timing Advance and Measurement Reports." The proposed "hybrid" processing integrates all available

	information, including that of "Enhanced Cell ID." IP: Integration of Infrastructure And AGPS: Under "Detailed Description" "infrastructure" "measurement types," the "TAs" type is included.
9. (Original) A method as recited in claim 1, further comprising using collateral information in performing said location-determination calculations.	Claims 9 & 18: IP: Integration of Infrastructure And AGPS: The "optimal combination of multi-source information" is to be produced as a "probabilistic estimate" using a "max likelihood formulation" based upon the "Bayes probability" to provide an a posteriori logarithm of the likelihood. This standard/common statistical formulation is inherently applied for the inclusion of collateral information in the calculation of the likelihood, because the combined probability with both the measurements and the collateral information is calculated through the Bayes product of the conditional probability of the measurements alone (in product with) the marginal (collaterally determined) probability of the potential location/position, which is the objective of the calculations. (If the collateral information were not to be accommodated/integrated, then the full Bayes-product formulation is not (inherently) applied.)
10. (Original) A method as recited in claim 1, wherein said method is employed to achieve applicable Federal Communications Commission (FCC) accuracy requirements for E 911.	Claims 10 & 19: Proposal Document: para 4.1, pp. 8, 9 (in contradistinction with para. 3.5, p. 7) -- Although the end of para 3.5, p. 7, explicitly states that TruePosition does not warrant that AGPS (including the proposed implementation) can meet FCC accuracy requirements, it is important to note that these claims 10 & 19 refer to the "hybrid" integrated exploitation of AGPS in combination with infrastructure measurements (as claimed in the independent claims 1 & 11). Although such statement of FCC compliance does not explicitly occur in the proposal, the improved accuracies discussed in para 4.1, p. 8, implicitly infer it. By prior

	usage and testing, the author and the recipient of the proposal are/were both aware of TruePosition's compliance with FCC requirements with the use of the infrastructure data alone. So, since it is stated in para. 4.1, p. 9, that the combination of measurement information produces "a location that is better than either [infrastructure or AGPS] alone," both the author and the recipient implicitly understood that the proposed hybrid processing also complies with FCC accuracy requirements.

16. The above table also supports our conception of dependent claims 12 – 20.

Conclusion

17. To summarize and reiterate, we declare that we invented the subject matter recited by our rejected claims prior to the December 8, 2003 purported presentation date of Biacs et al. We further hereby declare that we worked diligently from a date prior to the purported presentation date of Biacs et al. (December 8, 2003) to our patent application filing date of December 30, 2003, in order to prepare said application.

18. We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information or belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like are punishable by fine or by imprisonment, or both, under § 1001 of Title 18 of the United States Code, and that such willful statements may jeopardize the validity of the application, any patent issuing thereupon, or any patent to which this verified statement is directed.

DATED: This 24 day of January, 2007.

ROBERT J. ANDERSON

DATED: This 14th day of January, 2007.

JOHN E. MALONEY

TruePosition

Proposal for
Wireless Location Services
Based On Lb Interface

Prepared for [redacted]

Statements of technical capabilities included in this document are for informational purposes only and are provided to the reader in a spirit of professional cooperation. No part of this document constitutes an offer or implies a commitment or obligation on the part of TruePosition.

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Notices

1 Executive Summary

TruePosition is pleased to offer [redacted] this proposal describing the support of location-based services using the Lb GSM interface with the AnyPhone AnyWhere™ location solution.

[redacted] is in the process of choosing whether the TruePosition equipment will interface with the major equipment vendors at the Lb level (SMLC) or Lbis level (PDE). We firmly believe that support of U-TDOA through the GSM Lb interface offers the best overall solution to [redacted] for location-based services (including E911). This document describes why the Lb solution is superior from a technical, operating, financial, and service deployment perspective.

- As indicated by [redacted] there is no immediate short-term difference in cost between the Lb and Lbis solutions. However, this document will show that the long-term benefits in total cost-of-ownership of a TruePosition supplied SMLC are noteworthy. This is particularly true as the LBS market matures and users demand a broader range of QoS for location requests.

- The reduction in overall network equipment (in terms of both numbers and vendors) in the Lb solution will reduce the requirement for regression testing.

- TruePosition will offer a comprehensive O&M solution based on more than the limited functionality of the RDSP protocol. TruePosition will customize the solution to meet [redacted] O&M requirements for all location technologies.

TruePosition will show in this proposal that hybrid location techniques have significant merit, both technically and commercially. TruePosition believes that the hybrid approach offers the best overall performance option for a location network in terms of both overall accuracy and yield. However, from a practical point of view hybrid location can be supported only via the Lb interface to the TruePosition iFind™ SMLC, which is therefore a superior strategic choice.

2 The Lb Approach

This section briefly describes the two options of interconnection for the Lb interface, SS7 or SIGTRAN/IP.

2.1 Lb over SS7

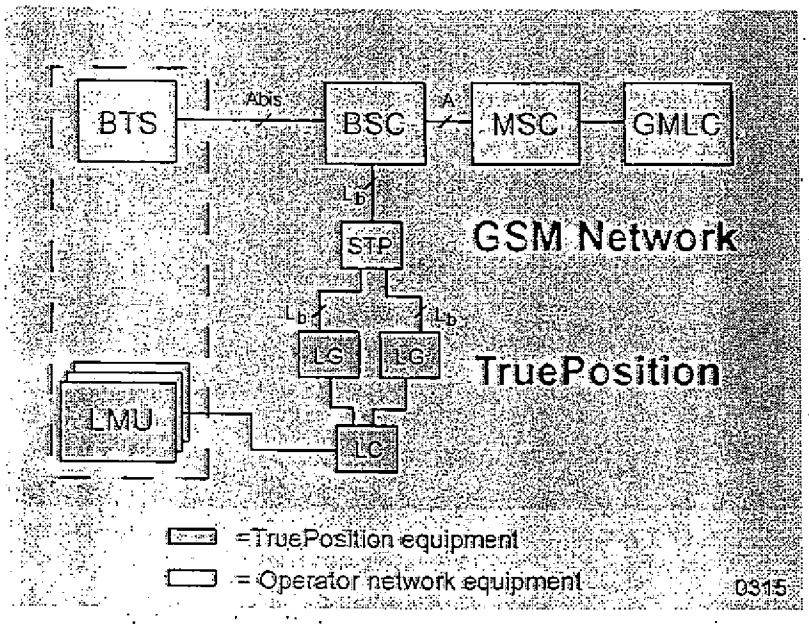

Figure 2-1. SS7 Option

The SS7-based Lb proposal connects the TruePosition Location Gateway to the BSC via an STP. The method requires an upgrade to the existing Location Gateway (Release 6.0 LG or Release 7.0 LG) equipment in the network. The upgrade includes both software and hardware components for the existing Sun platform. The SS7 product will also be fully available on the new Intel-based platform, which is scheduled for 1Q04 (See *Section 5 Product Roadmap*).

TruePosition recommends the SS7 interconnection method as the preferred option for wide deployment across all markets (excepting those in which [redacted] equipment is used; see next section).

In TruePosition's architectural solution, the Location Gateway handles all decisions related to choice of technology based on QoS (accuracy and latency). Meanwhile, the Location Calculator performs calculations for all technologies including Enhanced Cell ID, A-GPS and U-TDOA. The Location Calculator is scalable by adding up to three DSP cards per LC. When the shift is made to an Intel-based platform, future upgrades will take advantage of yearly improvements in processing power as well as the addition of DSP cards. Finally, by placing all location methods

under a single software framework, capacity can be dynamically shifted from Enhanced Cell ID to A-GPS and to U-TDOA as loads change in real time.

2.2 Lb over IP

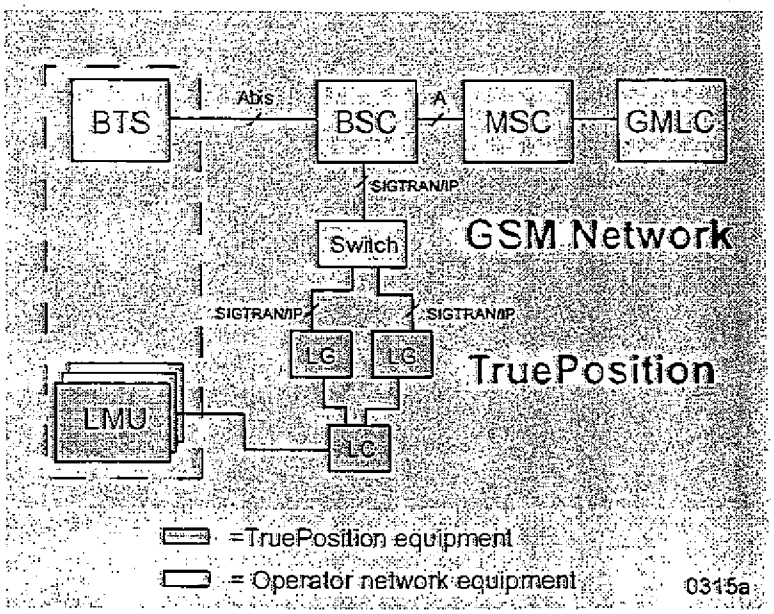

Figure 2-2. IP Option

In the IP-based Lb solution, the TruePosition Location Gateway connects to the BSC via an IP switch using the SIGTRAN protocol. This method will be available only with the Intel-based LG product, which is contained in a release shortly following Lb in 2Q04 (See Section 5 Product Roadmap).

TruePosition recommends limiting this interconnection technique to markets. The implication of this recommendation is that existing -based Location Gateway equipment (Release 6.0 LG or Release 7.0 LG) would need to be swapped for the new Intel-based platform. TruePosition estimates that of the 17 deployed LG pairs, eight pairs connect to systems. The equipment could be re-deployed in new, markets or placed into spare pool.

3 Lb Considerations

A number of considerations come into play in deciding between Lb and Lbis connection. This section outlines some of the tradeoffs involved in the two choices.

3.1 TruePosition SS7 and SIGTRAN Capabilities

TruePosition can deliver industry-grade SS7 products based on both in-house expertise and the strength of our vendors.

The LG uses [redacted] SS7 PCI boards that enable physical SS7 connectivity to the STPs or other signaling end points. [redacted] is one of the leading global suppliers of SS7 protocol stacks to major telecommunications companies in more than 35 countries across the world. The [redacted] Version 3.X has been certified by several countries in Europe, Asia, Australia and South America. Several major networks such as AT&T, Chung Hwa Telecom, Deutsche Telekom, France Telecom, NTT, Orange, Telefonica, Telstra have deployed [redacted] protocol stack and boards.

The [redacted] SS-7 has been tested and is connected to the following infrastructure equipment:

- Ericsson AXE-10, CME-20, CXE
- Nortel DMS100
- Lucent 5ESS
- Alcatel E-10, S1240
- Siemens EWSD
- Nokia DX200
- Motorola
- NEC
- Hua Wei
- Hyundai
- Interwave

In WLS architecture, each LG contains one [redacted] SS7 card. Since LGs are deployed in mated pairs, the SS7 cards operate in fully redundant configuration. The SS7 board implements the MTP and SCCP protocol stack and the TruePosition applications interface to these cards using NMS API.

The following features make TruePosition SS7 based Lb solution one of the most robust architectures available today:

- **Redundancy**: The two SS7 cards in mated LGs support single point code, therefore providing full redundancy between MTP and SCCP layer. In addition, health

management software capability in NMS SS7 allows the application to detect and recover from hardware and software failures.

- Performance Optimization: A board-based processor manages the SS7 protocol stack, avoiding a performance impact on LG processors.

- Standards Compliance: The SS7 boards are fully compliant with North American and European standards. The following standards are supported by the SS7 stack:

    - *SCCP standards*: Q.711-715 (ITU-T 1996), Q.786 (ITU-T 1995), T1.112 (ANSI-1995), and *MTP standards*: T1.111 (ANSI), ETS 300-008-1,2 (ETSI-1997), GF001-9001 (SS7 for China), Q.701-702 (ITU-T 1992), Q.703-704 (ITU-T 1996), Q.707 (ITU-T 1992), Q.781-782 (ITU-T 1996)

- High Availability: TruePosition's carrier grade SS7 solution for the Lb interface with redundancy is a platform with 99.999% availability. The two SS7 boards in the LG work in active (primary) and standby (backup) mode. Therefore, if the primary board fails, inter-board communication causes the backup boards to become active and support all SS7 traffic.

In addition to a robust SS7 solution, TruePosition has SS7 experts who have deployed and built solutions for wireless carriers.

3.2 Migration to TruePosition iFind™ SMLC

The migration to a fully TruePosition SMLC platform across [redacted] network can evolve incrementally. Since all the existing SMLC equipment is connected at the BSC level, the changeover can also be made on a BSC-by-BSC basis. Typically, the SS7 Point Code would simply need to be provisioned once to point towards the TruePosition iFind™ SMLC from the old equipment. No impacts are foreseen in provisioning at either the MSC or GMLC to accomplish this task.

The TruePosition iFind™ SMLC, consisting of Location Calculator and Location Gateway components, is a distributed system. A distributed SMLC allows more flexibility in physical deployments and migration plans. Both the Location Calculator and Location Gateway can scale independently to meet the needs of a phased migration.

TruePosition will provide the transitional functionality and service as part of this proposal. The primary advantage of a single SMLC supplier within the network is consistency of platform. Performance and operations improvements are also gained through this consistency (these points are addressed in detail in a later section).

3.3 Interoperability and Regression Testing

The interconnection method under Lbis creates an additional interface in the network. Further, the Lbis interface is non-standardized and will require continuing additional effort on the part of all suppliers to support over the long term. This creates additional load on interoperability testing as major vendors must test both the Lb interface (for connection to 3rd party SMLCs in international markets) and the Lbis (for connection to North American carriers under the 911 mandate.)

Further, for true regression testing each major vendor would need to perform end-to-end testing with TruePosition across the full Lb-Lbis interface set in the course of each major SMLC release and each major BSC release. This is particularly true in the case of uncoordinated BSC and SMLC release timeframes on the part of the major vendors. Interoperability testing across a standards-based and controlled Lb interface is more straightforward and well known than testing across the four similar but slightly different Lbis interfaces.

An immediate impact of selection of the Lb interface is that the total number of nodes in the network is reduced. Reduced nodes result in reduced interoperability and regression testing complexity over the long term.

3.4 Support of Integrated Enhanced Cell ID

TruePosition's Enhanced Cell ID product is based on Cell ID + Timing Advance + Measurement Reports. *This product is a feature upgrade to the iFind™ SMLC and will be referred in this document as the iFind™ SMLC ECID solution.* The TruePosition iFind™ ECID solution relies on the standardized L-series information elements for Timing Advance and Measurement Reports. Our solution builds on our existing database of antenna information, height, and down-tilt that exist with our SCOUT product for U-TDOA.

The iFind™ ECID solution would be offered on a national basis. TruePosition would interconnect via the Lb interface to the BSC and receive the standardized Quality of Service parameters to determine which location method, or combination of methods, best satisfies the specific location QoS request. In the event of complete unavailability of U-TDOA, A-GPS, or a hybrid, the iFind™ ECID solution would be used by default.

3.5 Support of Integrated A-GPS

TruePosition's Assisted GPS product is standards-based and will provide assistance data and position processing. This product is a feature upgrade to the iFind™ SMLC and will be referred in this document as the *iFind™ SMLC A-GPS solution.* The TruePosition iFind™ A-GPS solution has the following characteristics:

- Gathers GPS navigational data from the existing U-TDOA LMU network

- Supports in-call RRLP (SMLC-MS location protocol) to provide assistance data to the MS and receive measurements (or pseudo ranges) from the MS
    - Computes location using TruePosition patented methodology
    - Computes hybrid locations by combining AGPS and TDOA hyperbolic time-baselines
- Installs as a simple software upgrade to existing TruePosition iFind™ SMLC equipment
- Dynamically transfers processing capacity between Enhanced Cell ID, A-GPS, and U-TDOA or hybrid location requests based on load

gains several benefits by supporting Lb and upgrading the TruePosition iFind™ SMLC to support iFind™ A-GPS. No independent A-GPS server is needed as an additional node in the network. The existing untapped transaction capacity of the TruePosition iFind™ SMLC network can be dynamically used for A-GPS (or even Enhanced Cell ID on a demand basis). TruePosition is able to structure the iFind™ A-GPS product as a low up-front cost upgrade plus transaction fees consistent with the model used in the MSA.

TruePosition does not believe that A-GPS can be used to meet FCC E-911 Phase II accuracy requirements for handset systems. For this reason, the TruePosition does not warrant that its iFind™ SMLC feature for A-GPS support will meet the FCC E-911 Phase II accuracy requirement for handset-based systems.

4 Benefits of the TruePosition Lb Approach

TruePosition is convinced that U-TDOA support by Base Station Controllers (BSC) via the Lb interface will provide benefits in a number of areas as implements location-based services in its GSM networks.

The areas of benefit include:

- Performance – Enhanced locations, accuracy and yield
- Operational – Comprehensive O&M solution
- Cost – Competitive terms

4.1 Performance Benefits

Several performance improvements are gained through the proposed Lb solution:

- Hybrid locations combining A-GPS and U-TDOA are possible.
- QoS decision-making is concentrated in the node best able to assess all location metric information.
- Location capacity scaling becomes dynamic across all location methods: Enhanced Cell ID, A-GPS, U-TDOA and hybrid.

Hybrid: An estimated accuracy improvement of 30% over U-TDOA alone in "partially blocked" A-GPS environments is expected from the hybridization of location methods. Hybridization combines information from location methods including A-GPS and U-TDOA.

Enhanced Cell ID is the simplest to integrate in this model. For the case in which neither A-GPS nor U-TDOA is deployed in a market, the iFind™ ECID solution can provide a minimal level of service. Further, the current TruePosition iFind™ SMLC already contains the topological information needed to determine if advanced U-TDOA service (or future A-GPS service) is offered in a specific coverage area.

Hybridization becomes significantly more attractive when combining A-GPS and U-TDOA data to produce a "blended" location. As background, both the A-GPS and U-TDOA system rely on the use of Time Difference of Arrival and generate hyperbolic time baselines. For each satellite or terrestrial antenna used in the solution, a baseline is constructed. These baselines are placed jointly into the TruePosition geospatial algorithm to calculate an optimal solution.

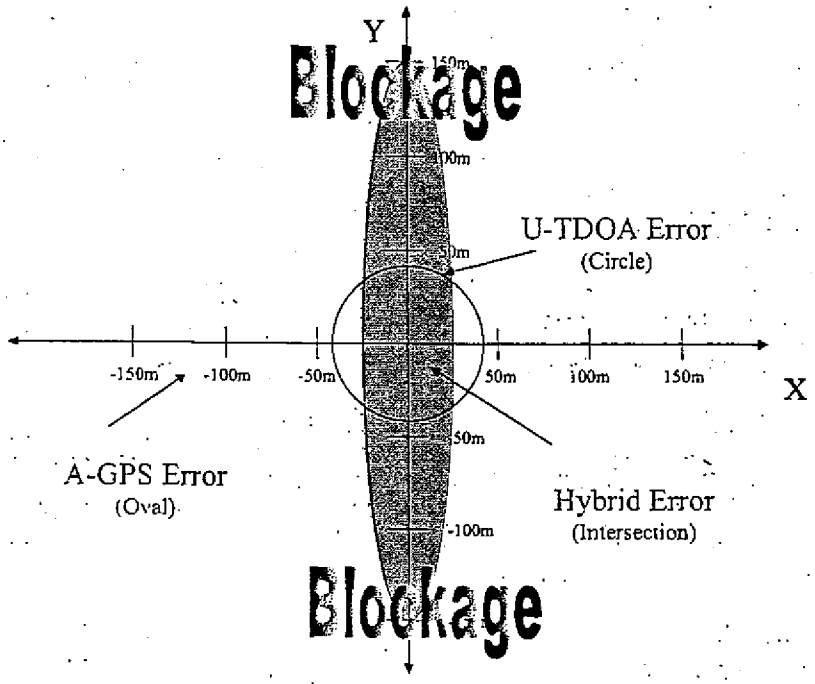

Figure 3. Hybridization to Reduce Location Error Due to Blockage

Figure 3 illustrates the effect when an A-GPS calculation is partially blocked, resulting in poor resolution in the "Y" direction. The U-TDOA measurements are able to augment the failed A-GPS "Y" component and produce a location that is better than either the U-TDOA or A-GPS alone

If too few baselines are available due to satellite or terrestrial blockage or interference, the hybrid model makes a location possible where either single method would fail.

The hybrid method is only available to an SMLC that has direct access to both A-GPS and U-TDOA baseline information. There is no L-interface standardization of hyperbolic baseline transfer, nor is it likely to become an option at 3GPP. Only by combining the A-GPS and U-TDOA SMLC nodes together can this value be realized. TruePosition has substantial expertise in the area of hyperbolic TDOA numerical methods and data combination and we present the best option for creating a comprehensive product in this area.

Universal Location Technology Selection Algorithm: The correct choice of location method to apply to a specific positioning request is a dynamic decision, not a static one. The node, which executes this decision, should have access to real-time information as to the availability of resources to execute any particular request. In a market where multiple location methods are used, the challenge is non-trivial.

TruePosition believes strongly that the correct design and implementation of a *Universal Location Technology Selection Algorithm* is a critical component to the future success of location services. As a result, TruePosition is placing specific emphasis on the development of this functionality within the iFind™ SMLC. The availability of this function is listed in *Section 5 Product Roadmap*.

The Universal Location Technology Selection Algorithm performs the critical function of interpreting QoS requirements, assessing available location resources across all location technologies, and commanding the appropriate resources to execute the required location transaction. This function is dynamic across location technologies and is performed in real time; often operating under tight QoS latency constraints.

TruePosition has a significant core competence in location determination algorithms and today makes real-time QoS choices between the application of TDOA, FDOA, Phased Array AoA, Power Measurement AoA, MultiPath Mitigation and other resources. Expanding this real-time QoS capability to include Enhanced Cell ID and A-GPS (plus hybrid) is a logical choice. TruePosition's iFind™ SMLC is well suited to interpret QoS parameters into a specific ECID, A-GPS, TDOA, or hybrid commands and allows for best use of the resources engaged in location.

The TruePosition iFind™ product will provide the Universal Location Technology Selection function through integration of the following:

- Access to resources across the broad array of TruePosition network components and location methods
- SCOUT management of each technology's estimate of accuracy and latency plus SCOUT management of location capability and preference on a cell site basis
- Location Gateway real-time use of the pre-loaded SCOUT database
- Location Gateway real-time determination of location method and applied resources based on QoS – creating highest "meet or exceed" metric with minimal resources
- Automatic Location Gateway selection of alternative candidates/methods if time remains and initial location method fails. This includes the ability to fall back to hybrid methods if there is a yield failure in the primary location choice.
- Inclusion of hybrid processing, if available and required under the QoS.

Location Capacity Scaling: An integral aspect of the TruePosition iFind™ SMLC platform is dynamic capacity shifting between location methods including iFind™ ECID, iFind™ AGPS, iFind™ U-TDOA and hybrid. The load associated with each of these methods is directly

transferable from one to the other. The Location Calculator capacity of 20 locations per second per DSP board remains constant regardless of which combination of methods is loading the system. This simplicity avoids the need for scaling multiple heterogeneous nodes across several vendors in the [redacted] network.

4.2 Operational Benefits

The operational benefit available to [redacted] by accepting TruePosition's proposal is the creation of a comprehensive O&M solution. The comprehensive O&M solution places the configuration and management of all location systems in the network under one platform.

The U-TDOA Systems Study Group originally recommended the use of RDSP. This proposal has significant drawbacks that impact O&M viability. The requirements of U-TDOA location processing impose the collection of over 100 information elements from adjunct systems. For example, these information elements include antenna heights, antenna types, precise orientation, and down-tilt. The RDSP protocol supports less than 15 percent of the required information elements. Further, the RDSP method only focuses on GSM and TruePosition proposes to integrate the full O&M requirements for TDMA and GSM under this proposal. TruePosition proposes to take the O&M integration project on a time-and-material basis to create a consolidated data management system.

TruePosition proposes to use SCOUT (or a SCOUT-like tool) as the data management core and collect or accept data sets from the RAN equipment, RF planning tools, and ancillary systems. As a starting point, the tool would accept the provisioning dat[redacted] currently provides to the existing major vendor SMLCs in the existing format. This approach offers several benefits by:

- Removal of four disparate SMLC types [redacted] each with unique O&M requirements
- Consolidation on a single SMLC vendor across the network with a single set of O&M requirements and interfaces
- Performing the O&M for management of both GSM and TDMA information elements
- Creation of a permanent and effective O&M solution under a single "owner" for all technologies, eliminating the need to perform engineering "by committee"
- Integration of the O&M system, eliminating manual U-TDOA configuration required under current multi-vendor SMLC model
- Configuration is consolidated for all location technologies: Provisioning for Enhanced Cell ID and A-GPS is a subset of U-TDOA

4.3 Cost Benefits

This proposal creates several cost benefits, both in terms of the direct offer from TruePosition and also in cost reductions in other related programs.

- No separate A-GPS hardware servers are needed in the network
- Both A-GPS and Enhanced Cell ID are offered as software only upgrades to the existing TruePosition iFind™ SMLC equipment (consisting of both Location Calculator and Location Gateway)
- Less overall location processing capacity needs to be purchased since the TruePosition iFind™ SMLC can dynamically distribute location capacity between Enhanced Cell ID, A-GPS and U-TDOA
- No additional expenditure for the Lbis interface from the major infrastructure vendors -- this is true for [redacted] as well.
- O&M functionality is offered as a time and materials (T&M) program with no additional "product" fee once integrated into the TruePosition equipment
- The TruePosition offer is structured as a low up-front cost model with transaction fees and is consistent with the MSA

5 Product Roadmap

This section describes availability of:

- **Lb support of U-TDOA** – TruePosition's Lb solution will rely on using U-TDOA over the Lb link and will eliminate the need for Abis monitoring units to support GSM systems.
    - Lb U-TDOA (SS7 version) ready for IOT testing to begin 1Q04 (Target of January 2nd)
    - Lb U-TDOA (SS7 version) FOA availability by 1Q04 (Target of February)
        - SIGTRAN capability is currently planned for availability in the 2Q04, as an optional feature. TruePosition recognizes the strategic importance of SIGTRAN, based on the penetration of access hardware in the markets. We will work with to expedite the availability of this feature in accordance with needs.
- **SafetyNet** location (see Section 2.2) – TruePosition intends to support current functionality under this proposal. As such, we commit to having stand-alone clusters capable of supporting iFind™ ECID independently of U-TDOA infrastructure or availability. The iFind™ ECID-solution (and the stand alone cluster hardware) will be available in the same timeframe as the Lb solution, 1Q04.
- **Universal Location Technology Selection Algorithm** - TruePosition is a location technology-centric company. As such, we are uniquely qualified to provide management capability for a location system that incorporates a heterogeneous mix of location technologies (i.e. TDOA, Enhanced Cell ID, A-GPS, etc.). TruePosition's intent is to supply a technology selection algorithm that performs real-time determination of the appropriate location resources based on goals (i.e. QoS, customer SLAs, cost efficiencies, etc.). TruePosition has the Universal Location Technology Selection Algorithm scheduled for completion in 3Q04.
- **Enhanced Cell ID** – The iFind™ SMLC will offer a feature upgrade for Enhanced Cell ID as a core component of TruePosition's Lb proposal. TruePosition anticipates deployment of a very high quality Enhanced Cell ID product, which is made more effective by the cooperation of nearby TDOA and/or alternate technology sites. The TruePosition solution will support iFind™ SMLC ECID-solution alongside the availability of the Lb solution in 1Q04.
- **A-GPS** –. TruePosition recognizes the importance of A-GPS to and can negotiate deployment timeframe for the new iFind™ SMLC A-GPS feature based on

[redacted] needs. Further, since the iFind™ SMLC A-GPS solution relies on the handset, TruePosition will work with [redacted] to refine the specifications of this offer so as to accommodate the greatest quantity of the most compelling handset types available. TruePosition proposes to add the iFind™ SMLC A-GPS solution to our location technology suite by 3Q04.

- Hybrid A-GPS + U-TDOA – One of the greatest weaknesses of A-GPS technology is its performance in in-building and in urban-canyon environments, where clear sky capabilities are limited. Through the combination of A-GPS with the iFind™ products noted above, TruePosition will be able to provide [redacted] with significant accuracy improvements in the areas most important to commercial services deployment. Hybrid location will be available in 3Q04.

While this development is underway, the AMS will remain as an interim solution. In addition, the AMS provides risk mitigation in the event of location requirements for GPRS/EDGE and the resulting new requirements that would again be placed on the major infrastructure vendors.

6 Pricing

TruePosition is pleased to present the following pricing for both the Lb interface and the additional technology options. It is TruePosition's intent to provide [redacted] with maximum flexibility to take advantage of options presented in this proposal and to select the most applicable options on a market-by-market basis. As a result of this flexibility, there are a number of different pricing scenarios, each of which is identified on the pricing sheet contained herein. Each pricing section is described briefly to provide clarity among the several options being presented.

Lb Upgrade –Hardware and Software – This section provides pricing for the three possible configurations of the Lb interface. The first configuration supports the Lb interface over SS7, which is required for LGs serving markets with RAN equipment from vendors other than [redacted]. The second configuration supports the Lb interface over SIGTRAN, which is required for LGs serving markets with [redacted] equipment. The third configuration supports the Lb interface over both SS7 and SIGTRAN, which is required for LGs serving markets with RAN equipment from [redacted] and other vendors. The hardware and software upgrade and annual software maintenance fees identified in this section are required in order to implement support for the Lb interface in new LGs as well as previously deployed LGs. These fees are per deployed LG and are in addition to the fees required for U-TDOA support. Both LGs in each mated pair of LGs must be upgraded.

ECID (CGI+TA) Upgrade to iFind SMLC – This section provides pricing for adding Enhanced Cell ID (CGI+TA) positioning capability to a LG. The software upgrade and annual software maintenance fees identified in this section are required in order to implement support for ECID positioning in new LGs as well as previously deployed LGs. These fees are per deployed LG and are in addition to the fees required for U-TDOA support. Both LGs in each mated pair of LGs must be upgraded. Lb interface support is required for this feature. This feature can be configured to provide ECID positioning support for up to all cells (BTSs) controlled by each BSC connected to the LG through an Lb interface, regardless of whether or not an LMU is deployed at each BTS. If [redacted] chooses to utilize TruePosition's support for the Lb interface, TruePosition is willing to waive the software license and annual software maintenance fees for this ECID positioning feature.

Hybrid U-TDOA/A-GPS Upgrade to iFind SMLC - This section provides pricing for adding hybrid U-TDOA/A-GPS positioning capability to a LG. The software upgrade and annual software maintenance fees identified in this section are required in order to implement support for hybrid U-TDOA/A-GPS positioning in new LGs as well as previously deployed LGs. These fees are per deployed LG and are in addition to the fees required for U-TDOA support. Both LGs in each mated pair of LGs must be upgraded. Lb interface support is required for this feature. This feature can be configured to provide A-GPS positioning support in up to all cells (BTSs) controlled by each BSC connected to the LG through an Lb interface, regardless of whether or not an LMU is deployed at each BTS. If [redacted] chooses to utilize TruePosition's support for

the Lb interface and commit to using this hybrid U-TDOA/A-GPS positioning feature for five years, TruePosition is willing to provide this hybrid U-TDOA/A-GPS positioning feature at the discounted prices identified in this section.

Installation Services - New greenfield iFind SMLC deployments – This section provides the incremental pricing for installation and testing services for deployment of a LG configured with Lb interface support within a market coincident with the deployment of TruePosition's U-TDOA infrastructure. These incremental installation and testing services fees are in addition to the fees required for installing and testing U-TDOA support. Additional Drive Test Tool upgrade fees may be required to facilitate testing of hybrid U-TDOA/A-GPS positioning depending on how handset manufacturers choose to implement the local control interface to A-GPS enabled handsets.

Installation Services - Upgrades to existing iFind SMLCs – This section provides pricing for the installation and testing services for upgrading a previously deployed LG with Lb interface support within a market that already contains TruePosition's U-TDOA infrastructure. This section also provides pricing for the installation and testing services for upgrading a previously deployed LG that already has Lb interface support with ECID and/or hybrid U-TDOA/A-GPS positioning capability. These installation and testing services fees are intended to cover the possible scenarios may encounter when rolling out support for Lb interface, ECID positioning, and hybrid U-TDOA/A-GPS positioning. Additional Drive Test Tool upgrade fees may be required to facilitate testing of hybrid U-TDOA/A-GPS positioning depending on how handset manufacturers choose to implement the local control interface to A-GPS enabled handsets.

Standalone iFind™ ECID and A-GPS centralized Server Node – This section provides pricing for a centralized Server Node used to provide ECID and A-GPS positioning capability to markets not covered by a LG with U-TDOA capability. This centralized Server Node is intended to allow to support ECID and A-GPS positioning capability in markets where U-TDOA has not yet been deployed. This allows to augment the ECID and hybrid U-TDOA/A-GPS positioning capability deployed in areas with U-TDOA capability, and allow network wide support for ECID and A-GPS positioning. This centralized Server Node can only provide ECID and A-GPS positioning capability in areas where U-TDOA has not yet been deployed and requires an Lb interface connection to each BSC being served. If chooses to deploy TruePosition's Lb interface, ECID positioning, and hybrid U-TDOA/A-GPS positioning capabilities, This centralized Server Node shall constitute "Other Products" for purposes of Section 11(ii) of MSA Amendment Number 2 (dated June 6, 2003).

Note: The standalone server can only provide A-GPS and ECID service to areas (BSCs) where U-TDOA has not been deployed. The 3GPP standards impose a 1:1 logical relationship between BSCs and SMLCs. If a geographic area serviced by a BSC requires U-TDOA service, that BSC's Lb interface must connect logically to a local LG to provide U-TDOA service. For A-GPS or

ECID service to be provided to the same BSC, the local LG must be software upgraded with hybrid U-TDOA/A-GPS and/or ECID positioning capability.

Other Services – This section provides pricing for the development support required to integrate the TruePosition U-TDOA, ECID and hybrid U-TDOA/A-GPS positioning network with OSS infrastructure to facilitate network provisioning and fault management. This section also provides pricing for the interoperability testing support required for each A-GPS enabled handset model. The requirements for these features are not defined well enough at this time to provide a firm quote. As a result, TruePosition is prepared to support these features on a time and materials basis at the identified rates. If chooses to deploy TruePosition's Lb interface, ECID positioning, and hybrid U-TDOA/A-GPS positioning capabilities, TruePosition will[1] for the OSS system integration support and for the first two A-GPS enabled handset models.

Transaction Pricing – This section provides pricing for hybrid U-TDOA/A-GPS and A-GPS location transactions, for each location performed using the hybrid U-TDOA/A-GPS and A-GPS positioning capabilities per the rates defined in the amended MSA. even when locations use a combination of U-TDOA and A-GPS positioning capabilities.

Lb Solution - Pricing	Unit Prices	Notes
Lb Upgrade - Hardware and Software		
Lb Upgrade over SS7		
Lb Upgrade over SIGTRAN - IP		New LG Hardware required for SIGTRAN IP
Lb Upgrade over SS7 and over SIGTRAN - IP		
Lb Upgrade over SS7 - Annual Software Maintenance		
Lb Upgrade over SIGTRAN - IP - Annual Software Maintenance)		
Lb Upgrade over SS7 and over SIGTRAN IP - Annual Software Maintenanc		
ECID (CGI + TA) Upgrade to IFind SMLC		
IFind ECID Upgrade - Software License		Contingent upon Lb interconnection, Covers BSCs linked to LG unit (as such, all BTSs served by these BSCs will have noted functionality).
IFind ECID Upgrade - Annual Software Maintenance		
Hybrid U-TDOA / A-GPS Upgrade to IFind SMLC		
Hybrid U-TDOA / A-GPS Upgrade - Software License*		Contingent upon Lb interconnection and a 5 year commitment to use the IFind Hybrid U-TDOA - A-GPS product. Covers BSCs linked to LG unit (as such, all BTSs served by these BSCs will have noted functionality).
Hybrid U-TDOA / A-GPS Upgrade - Annual Software Maintenance*		
** Upgrades to TDOA Solution - Upgrades are in addition to U-TDOA costs/fees - Must procure Upgrades for both LGs within a meted pair*		
Installation Services - New greenfield IFind SMLC deployments		
Incremental Installation Service for Lb (and ECID and/or Hybrid A-GPS if required) with simultaneous U-TDOA deployment		Applies when ECID and/or Hybrid A-GPS deployed at same time as U-TDOA.
Incremental testing for Lb (and ECID and/or Hybrid A-GPS if required) with simultaneous U-TDOA deployment**		
Installation Services - Upgrades to existing IFind SMLCs		
Lb (SS7 or SIGTRAN IP) Hardware and Software Installation including U-TDOA, ECID and A-GPS (When available)		
Installation Service for Lb (and ECID and/or Hybrid A-GPS if required) - on previously deployed U-TDOA system		Applies when ECID and/or Hybrid A-GPS deployed on existing U-TDOA systems.
Testing for Lb (and ECID and/or Hybrid A-GPS) - on previously deployed U-TDOA systems**		
Hybrid A-GPS and/or ECID Installation Services - On systems with Lb already deployed		
Installation Service for Hybrid A-GPS and/or ECID with Lb previously installed		
Testing for IFind Hybrid A-GPS and/or ECID with Lb previously installed**		
Additional fees may be required to upgrade drive test tools to support A-GPS enabled handsets		
Standalone IFind ECID and A-GPS centralized Server Node		
Centralized server node - Hardware and Software		
Annual Software maintenance fee - centralized Server Node		
ECID and A-GPS Software license for centralized Server Node		The Standalone Server Node can only provide A-GPS and ECID service to areas (BSCs) where U-TDOA has not yet been deployed - Prices contingent upon Lb interconnection, The stand-alone Server Node shall constitute "Other Products" for purposes of Section 11(i) of MSA Amendment Number 2 (dated June 6, 2003).
Annual Software Maintenance fee - ECID and A-GPS Software		
Installation of centralized Server Node		
ECID and A-GPS Operational Validation		
Other Services		
OSS System Integration Support		
Interoperability Testing per Handset to support A-GPS		
Transaction Pricing		
Transaction fees for Hybrid U-TDOA / A-GPS and for A-GPS locations	Rates as per amended MSA	Only one transaction fee will be payable per location performed, even if such location used a combination of TDOA and A-GPS functionality. Transaction fees payable as long as system is being used.

7 Conclusions

TruePosition believes that the Lb proposal offers the best overall solution for immediate and strategic needs. In summary:

- TruePosition is offering a comprehensive management capability, simplifying O&M
- TruePosition reduces SS7 technology risk by integrating a tested and established SS7 stack from a reputed vendor
- The proposed solution results in overall less equipment in the network (through the elimination of existing Major Vendor SMLCs). There will be a reduction in SMLC "types" from the existing five vendors
  down to one "type" – TruePosition.
- Both SigTran and SS7 connections are supported to the BSC
- Because the TruePosition iFind™ SMLC can handle locations from all technologies, control can be integrated over Customer LBS Experience, QoS, SLAs, transaction costs, etc.
- Through the hybrid method, which is possible only under the proposed Lb method, TruePosition can provide very high yields where A-GPS fails
- Through the hybrid method, the combination of A-GPS and U-TDOA will always be more accurate than either one singly – in particular for urban environments
- TruePosition's combined Enhanced Cell ID, A-GPS and U-TDOA processing generates consistent accuracies over all environments – this enhances the customer experience and accelerates uptake of location services

In conclusion, TruePosition believes that core location functions are best left in the hands of a proven location technology company.